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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,302	11/19/2001	Kyoung Hwan Chin	SEC.910	8429

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EXAMINER

PERRIN, JOSEPH L

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/988,302

Applicant(s)

CHIN ET AL.

Examiner

Joseph L. Perin, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. In view of applicant's amendment filed 21 January 2005, the status of the application is as follows:

#### Drawings Objections

2. The drawing correction has been approved by the Examiner.

#### Specification

3. The objection to the specification is withdrawn in view of applicant's amendment.

#### 35 U.S.C. §103(a) Rejections over AAPA in view of Schneider and Schneider/Sakai

4. Claims 10-13 have been canceled and, accordingly, all rejections over claims 10-13 have been rendered moot.
5. The rejection of claims 1-3 & 5 over AAPA in view of Schneider is maintained for at least the following reasons:
6. In response to applicant's argument that the figures of Schneider do not disclose the claimed nozzle arrangement, this is not persuasive because Schneider was cited as a secondary reference for the teaching that it is advantageous to provide a plurality of nozzles/orifices at regular intervals around a substrate to be processed to provide a "uniform distribution".
7. In response to applicant's argument that "[c]learly, no such arrangement is disclosed by the AAPA", this is not persuasive because the AAPA clearly shows such an arrangement with a set of nozzles "provided at regular intervals" on vertical chamber

walls. Contrary to applicant's arguments that providing a second set of nozzles "provided at regular intervals" is not mere duplication of parts, the only difference between the AAPA and applicant's claimed apparatus appears to be a second set of nozzles "provided at regular intervals". That is, the AAPA already discloses such a nozzle arrangement. Schneider provides a teaching that such a nozzle arrangement is known to provide "uniform distribution" of a gas on a substrate. The concept of providing a gas via nozzles located around a substrate at regular intervals in order to provide uniform distribution of gas to the substrate is known, as clearly illustrated in both AAPA and Schneider. Moreover, applicant argues that the "process gas nozzles" of Schneider and the "cleaning gas nozzles" claimed are different. However, the terms "process" and "cleaning" are considered intended use in applicant's claimed apparatus, which are given little patentable weight in apparatus claims. Similarly, the cleaning gas of applicant's claim 5 (which is an etchant gas) is intended use since the "cleaning gas" is not positively recited in the structurally claimed apparatus. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963). Even if, *arguendo*, one were to give weight to the intended use of the nozzles, the term "cleaning" is a species of the genus "processing" in the semiconductor art. And, in col. 4, lines 46-59, Schneider teaches that gas can be an etching gas, "etching" being well

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known in the semiconductor art as a species of the genus "cleaning". In fact, in claim 5 (directed to intended use), applicant attempts to claim the etching gas "NF<sub>3</sub>" as a "cleaning gas".

8. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as cited in the rejection, Schneider discloses proper motivation to arrange nozzles at regular intervals around the substrate in a "uniform distribution" in applying gas to treat a substrate in col. 5, line 12 *et seq.* (see previous Office Action). Moreover, as noted above, the processing gas of Schneider reads on applicant's "cleaning gas" since applicant's cleaning gas is an etching gas and Schneider's processing gas is an etching gas.

9. The rejection of claim 4 over AAPA in view of Schneider and Sakai is maintained for at least the following reasons:

10. In response to applicant's argument that Sakai introduces a "process gas" which is different from applicant's "cleaning gases", this is not persuasive because this is intended use (see above). In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce

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the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the spiral nozzle of Sakai is applied for the teaching of using a bent/spiral nozzle to provide a whirling gas which provides more uniform gas distribution in a semiconductor processing chamber. One of ordinary skill in the art would recognize the advantages of more uniform gas distribution in a semiconductor processing chamber.

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 1-3 & 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (hereinafter "AAPA") in view of Schneider (previously cited).

In Figures 1-2 of applicants' specification applicants teaches all the limitations of the pending claims, except that AAPA fails to teach at least three cleaning gas nozzles.

However, AAPA in Figure 2 does disclose a plurality of process gas nozzles disposed at regular intervals on a vertical sidewall of the chamber.

Schneider teaches that it is advantageous to provide a plurality of nozzles at regular intervals (see distributor 50 which includes a plurality of nozzles/orifices 115 at regular intervals, col. 5, line 12 *et seq.*) to provide a "uniform distribution".

Therefore, the position is taken that a person of ordinary skill in the art at the time the invention was made would have been motivated to modify the chamber of AAPA with a plurality of cleaning nozzles at disposed at regular intervals in order to improve the uniformity of applying cleaning fluid which would result in more uniform/efficient cleaning.

Moreover, the only difference between AAPA and the claimed invention is the number of nozzles even though Figure 2 clearly discloses AAPA as using a plurality of nozzles 18 disposed at regular intervals. The nozzles are not asserted to do anything different than they do in the prior art since the prior art does disclose using nozzles disposed at regular intervals. No evidence of unexpected results has been provided. It has been held that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Schneider, as cited above, and further in view of Sakai (previously cited).

Recitation of AAPA and Schneider are repeated from Above. AAPA and Schneider fail to explicitly disclose that at least one nozzle is bent in a spiral form toward a center portion of the chamber and in a direction from a lower portion to an upper portion relative to an upper surface of the chuck. It is noted that the specification has been

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relied on to understand what is contextually meant by the term "spiral". Sakai discloses the missing element (amounts of carrier gas are introduced through the nozzles of the carrier gas pipes 10 into the reaction chamber 6 along its inner wall in the direction indicated by the arrows 18 of FIG. 2, ... while whirling the reaction gas and carrier gas together." See figure 2 and *inter alia* column 3, line 28 *et seq.*) Additionally, Sakai provides the explicit motivation for making the claimed combination. Namely, Sakai states at column 2, line 9 *et seq.*, that such a modification provides an apparatus of simple construction capable of producing a semiconductor element while providing uniform thickness, composition and dimensional precision (see col. 2, line 10 *et seq.*). The artisan would have been motivated at the time the invention was made to make the claimed combination for the reason explicitly set forth by Sakai, including better mixing and improved product resulting from improved gas distribution.

### ***Conclusion***

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

15. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of




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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph L. Perrin, Ph.D. whose telephone number is (571)272-1305. The examiner can normally be reached on M-F 7:00-4:30, except alternate Fridays.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael E. Barr can be reached on (571)272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Joseph L. Perrin, Ph.D.  
Examiner  
Art Unit 1746

jlj